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File: USPT

Jun 10, 2003

DOCUMENT-IDENTIFIER: US 6577643 B1

TITLE: Message and communication system in a network

Drawing Description Text (20):

FIG. 18 is a configuration diagram of protocol stacks showing communications between an end system in a home network and an inter-working function in the home network where the cell site has remote access points coupled to a wireless hub through a wireless trunk;

Detailed Description Text (36):

2. Wireless hub function. Wireless hub 84 performs the foreign agent (FA) procedures, backhaul load balancing (e.g., over multiple T1's), backhaul network interfacing, and the xtunnel procedures. When support for quality of service (QOS) is present, the wireless hub implements the support for QOS by running the xtunnel protocol over backhauls with different QOS attributes. In a multi-sector cell site, a single wireless hub function is typically shared by multiple access points. A wireless hub includes a processor, a link to one or more access points (preferably in the form of an Ethernet link on a card or built into an ASIC), and a link to a backhaul line. The backhaul line is typically a T1 or T3 communications line that terminates in the mobile switching center of the wireless service provider. The link to the backhaul line formats data into a preferred format, for example, an Ethernet format, a frame relay format or an ATM format. The wireless hub processor runs software to support data bridging and various other functions as described herein. See discussion with respect to FIGS. 9, 10 and 11.

Detailed Description Text (39):

2. Remote AP architecture. In a remote AP architecture, access points usually have a very small range, typically around 1 km radius. They are located remotely (either indoors or outdoors) from the wireless hub. A T1 or a wireless trunk preferably links remote access points to the cell site where the wireless hub is located. From the cell site, a wire line backhaul or a microwave link is typically used to connect to the IWF in the MSC. If wireless trunking between the remote AP and the wireless hub is used, omni or sectorized wireless radios for trunking are utilized. The devices for trunking to remote access points are preferably co-located with the wireless hub and may be connected to it using an IEEE 802.3 network or may be directly plugged into the wireless hub's backplane. These devices will be referred to by the term trunk AP.

Detailed Description Text (66):

In FIG. 8, the MAC and PHY layers to/from the end system of FIG. 7 are replaced by a MAC and PHY for the trunk to the cell site for a remote access point. Specifically, for a T1 trunk, the high level data link control protocol (HDLC protocol) is preferably used over the T1.

Detailed Description Text (124):

3. Using RFC 2003, there is no easy way of creating tunnels taking into account quality of service and load balancing. In order to take QOS into account, it should be possible to set up tunnels over links that already provide the required QOS. Secondly, using RFC 2003, there is no easy way to provide load balancing to distribute bearer traffic load over multiple links between the base station and the

MSC.

Detailed Description Text (129):

2. The registration server is able to delegate the actual work of tunneling and relaying packets to a different IP address, and therefore, to a different server in the MSC. This permits the registration server to do load balancing across multiple IWF servers and to provide different QOS to various users.



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The Journal of Computing in Small Colleges April 2003

Volume 18 Issue 4

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